CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

June 2010

Technical Report No. 10-12

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 2010. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at only a few sampling locations during June (Figure 1). Low numbers of this dinoflagellate were detected at sites in Santa Barbara and Ventura counties. A low concentration of PSP toxins

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during June, 2010.

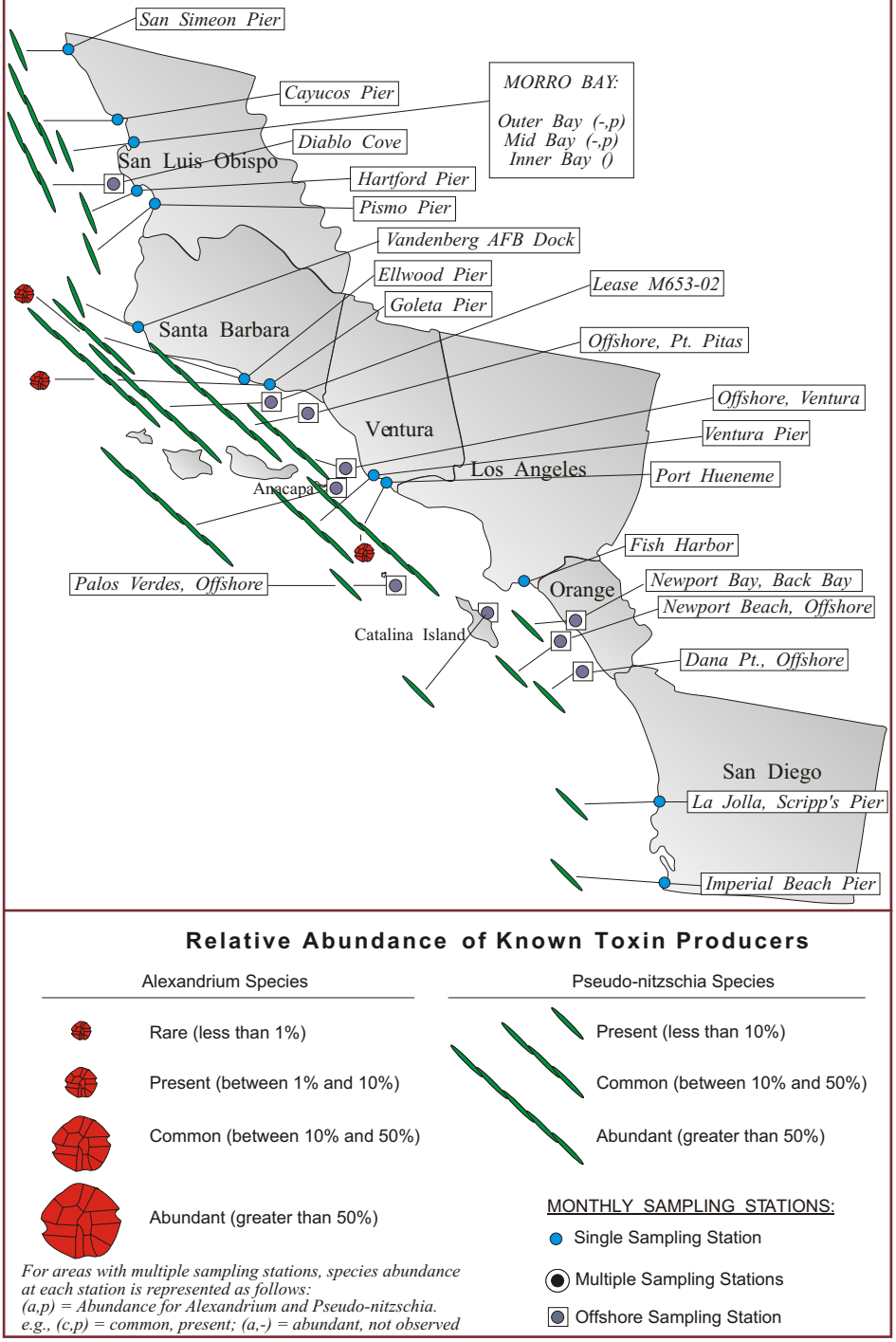
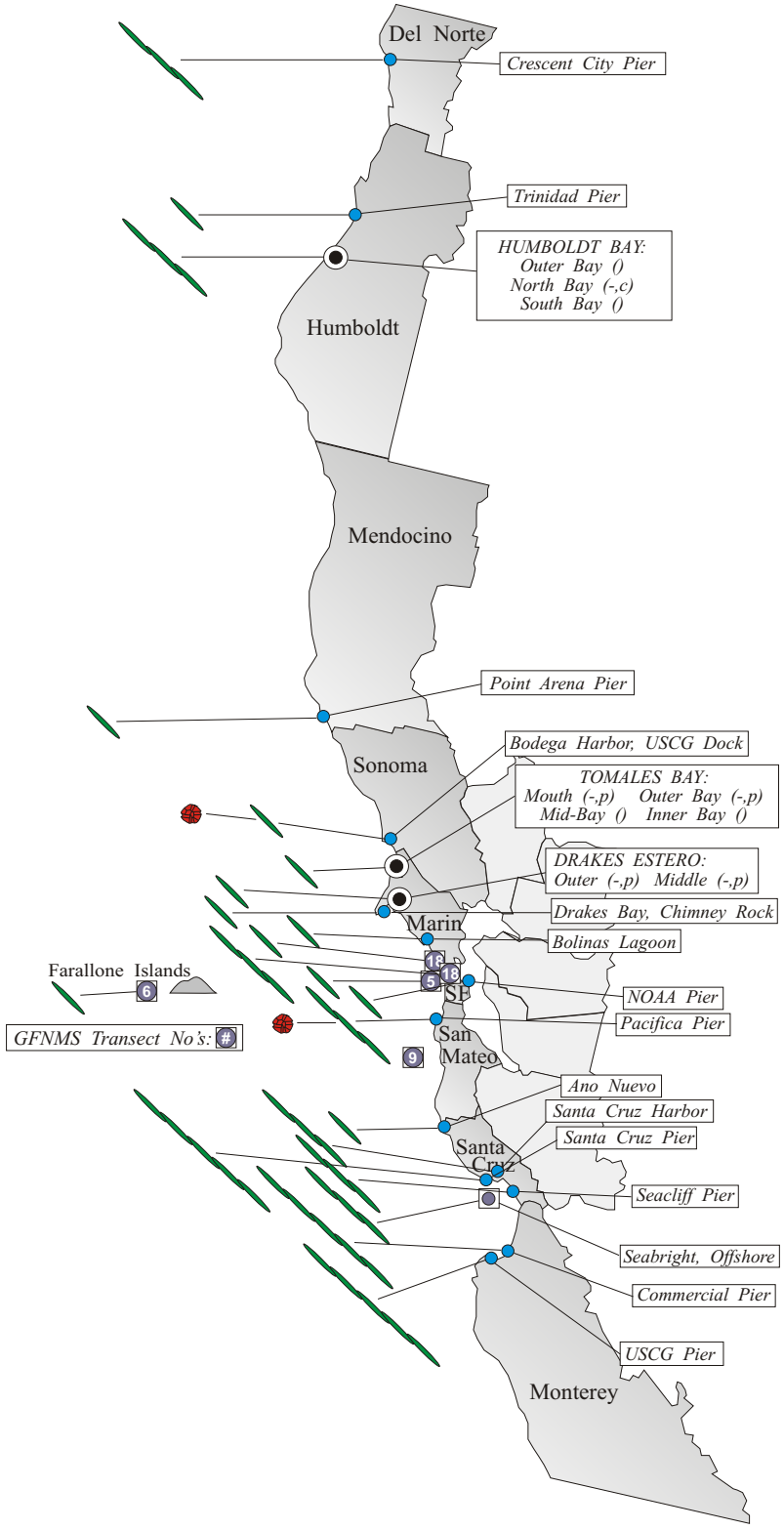


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2010.



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was detected in one shellfish sample from Goleta Pier (Santa Barbara) during the second week of the month (Figure 3).

Domoic Acid

Pseudo-nitzschia was detected along the entire southern California coast during June (Figure 1). This diatom remained abundant along the coast of Santa Barbara and Ventura counties, increased along the San Luis Obispo coast, and declined at sites between Los Angeles and San Diego counties. The highest relative abundances of *Pseudo-nitzschia* were observed at Ellwood Pier (Santa Barbara County) and offshore near Anacapa Island.

The high levels of domoic acid that were detected in shellfish samples from offshore of Santa Barbara during the last week of May continued through most of June. (Figure 3). Concentrations reached 75 ppm on June 15, then declined during the last week of the month. A low concentration of domoic acid was also detected in mussels from an offshore platform during the second week of June.

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along most of the southern California coast. *Skeletonema* was dominant along the San Luis Obispo coast,

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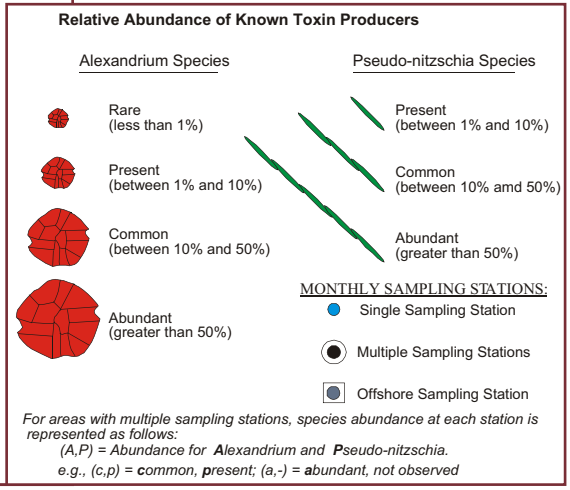
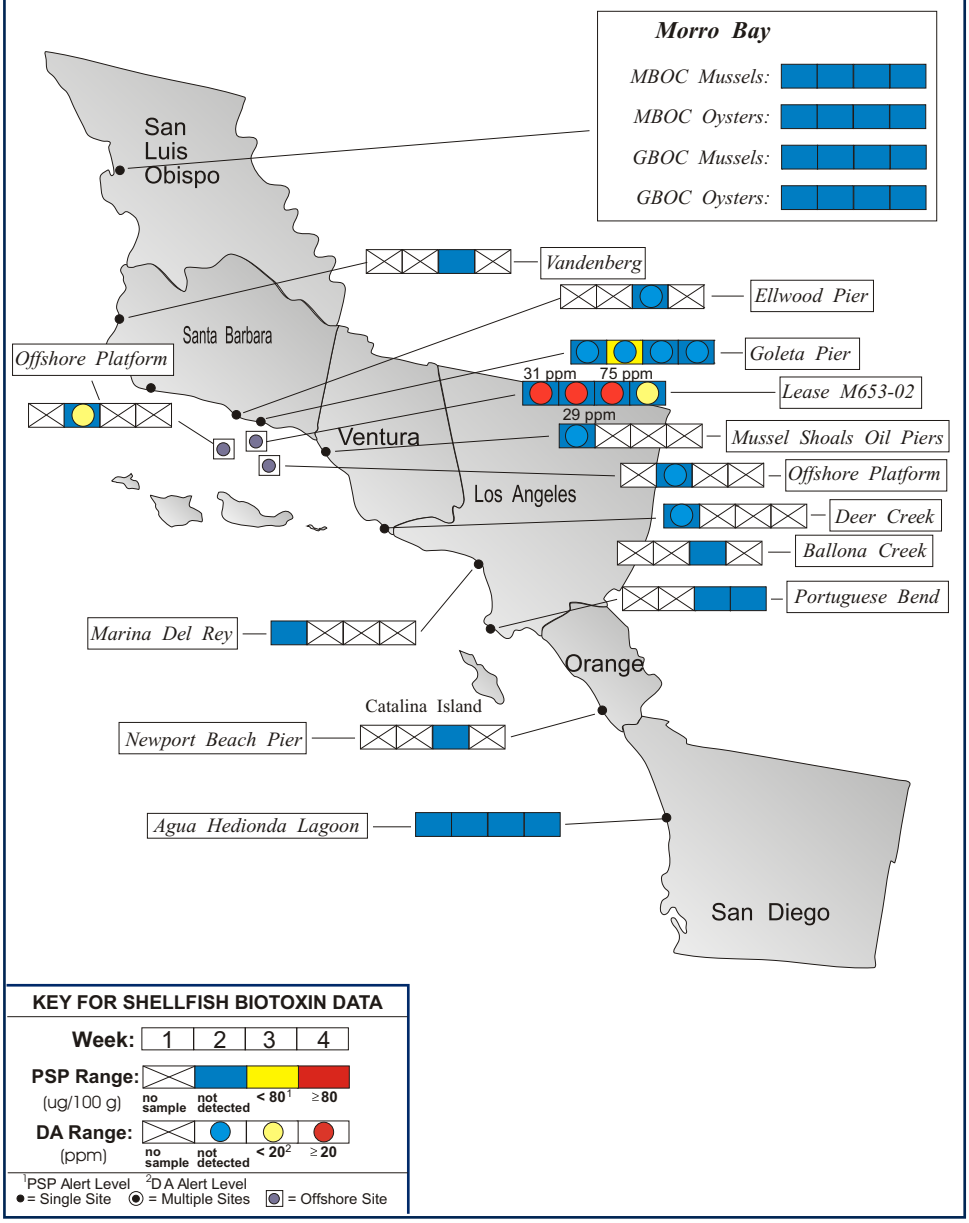


Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2010.



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while *Chaetoceros* was common between Santa Barbara and San Diego. Dinoflagellates began increasing in numbers along the southern California coast. *Lingulodinium polyedrum* was common throughout this range, with *Ceratium* and *Prorocentrum* common at selected sites.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at only two sampling locations during June (Figure 2). Low numbers of this dinoflagellate were observed at one site each in Sonoma and San Mateo counties. The low concentrations of PSP toxins detected in Humboldt County in May persisted into June. Sentinel mussels from Humboldt Bay contained low concentrations of these toxins through the first two or three weeks of the month (Indian Is. and USCG Pier, respectively). A low level of the PSP toxins was also detected in mussels from Trinidad Head during the third week of June (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at most sampling locations along the northern California coast during June (Figure 2). The

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

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highest relative abundances of *Pseudo-nitzschia* were observed at the Monterey USCG dock (June 24) and the Santa Cruz Pier (June 16). This diatom also dominated the phytoplankton assemblage, comprising a greater percentage of the total species present than observed during most of May.

A low concentration of domoic acid was detected in sentinel mussels from the Santa Cruz Pier during the first week of June and in mussels from Natural Bridges during the third week of the month. Samples of sardines from Monterey Bay did not contain detectable levels of domoic acid.

Non-toxic Species

Diatoms remained dominant along the northern California coast during June. *Skeletonema* and *Chaetoceros* were common at sites between Del Norte and San Mateo counties. Given the dominance of *Pseudo-nitzschia* inside Monterey Bay there were no other diatoms or dinoflagellates observed to be common in this region. The highest relative abundances of nontoxic species were observed in samples from the Trinidad Pier (*Skeletonema* and *Thalassiosira*), and the Pacifica Pier (*Chaetoceros)*.

QUARANTINES:

The annual mussel quarantine went into effect on May 1. This quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. All certified shellfish growers are required to

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Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2010.

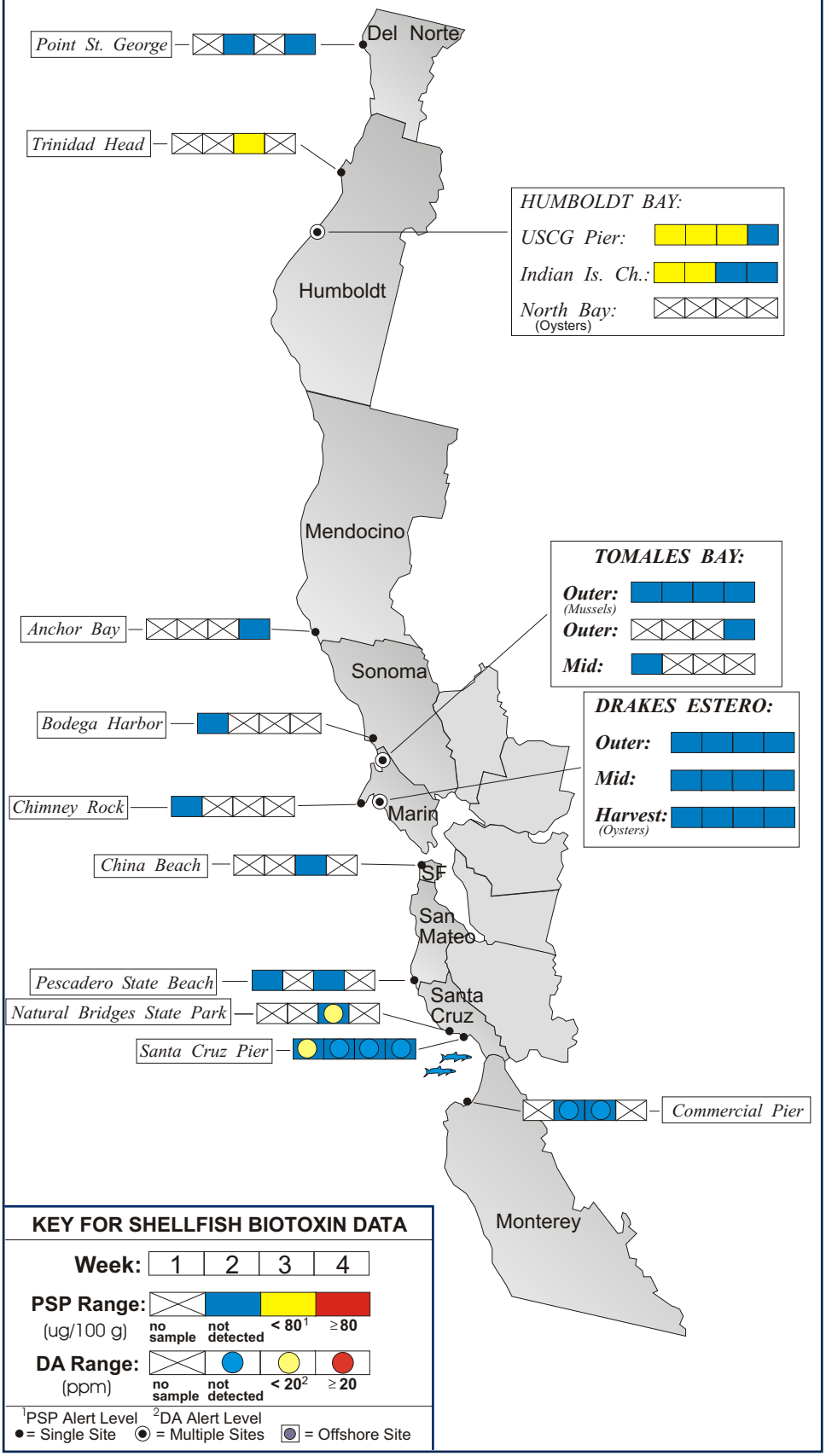

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Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during June, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	1
Mendocino	CDPH Volunteer (*Marie De Santis*)	1
Sonoma	CDPH Marine Biotoxin Monitoring Program	1
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	4
	Marin Oyster Company	2
	CDPH Marine Biotoxin Monitoring Program	1
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	Monterey Abalone Company	2
	CDPH Food and Drug Branch	2
San Luis Obispo	Grassy Bar Oyster Co.	8
	Morro Bay Oyster Company	10
Santa Barbara	Santa Barbara Mariculture Company	12
	U.C. Santa Barbara	9
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	4
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	5

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submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

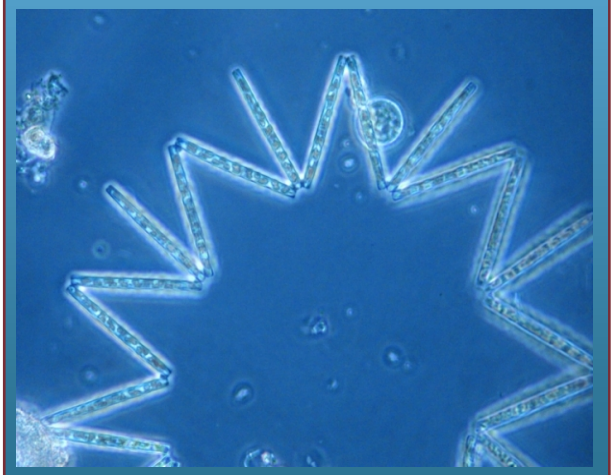
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2010.

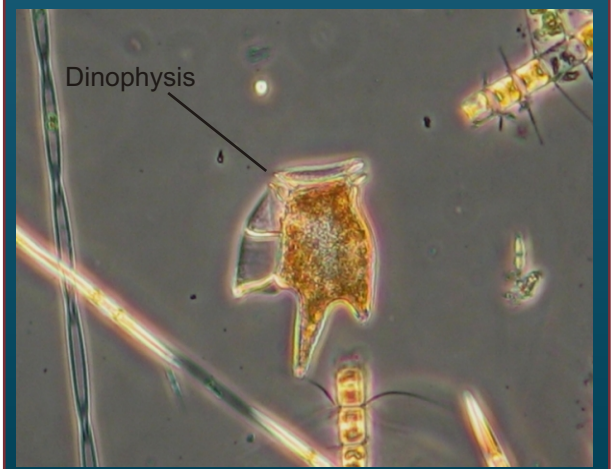
COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	Humboldt State University Marine Lab	1
Mendocino	CDPH Volunteer (*Marie De Santis*)	3
Sonoma	CDPH Marine Biotoxin Program	1
Marin	CDPH Volunteer *(Brent Anderson, Cal Strobel)*	6
	Drakes Bay Oyster Company	13
	Gulf of the Farallones National Marine Sanctuary	2
	Hog Island Oyster Company	2
	CDPH Marine Biotoxin Program	1
San Francisco	San Francisco Health Department	1
	Gulf of the Farallones National Marine Sanctuary	2
San Mateo	San Mateo County Environmental Health Dept.	2
	Gulf of the Farallones National Marine Sanctuary	1
	The Marine Mammal Center (*Stan Jensen*)	4
	U.C. Santa Cruz	4
Santa Cruz	California Department of Parks and Recreation	2
	The Marine Mammal Center (*Nancy Scarborough*)	2
	U.C. Santa Cruz	5
Monterey	CDPH Volunteer (*Jerry Norton*)	2
	CDPH Marine Biotoxin Program	1
	Friends of the Sea Otter (*Aya Obara*)	1
	Monterey Abalone Company	4
San Luis Obispo	Friends of the Sea Otter (*Kelly Cherry*)	4
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Morro Bay Oyster Company	5
	Tenera Environmental	3
	The Marine Mammal Center (*Tim Lytsell, P.J. Webb*)	5
Santa Barbara	CDPH Volunteer (*Sylvia Short*)	5
	Santa Barbara Mariculture Company	6
	U.C. Santa Barbara	5
	Vandenberg AFB	2
Ventura	CDPH Volunteer (*Fred Burgess*)	4
	Channel Islands National Marine Sanctuary	3
	Ventura County Environmental Health Department	1
	Guided Discoveries, Tole Mour	1
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	3
	Guided Discoveries, Tole Mour	1
	Southern California Marine Institute	1
Orange	California Department of Fish and Game	7
	Ocean Institute	1
	Orange County Health Care Agency	1
San Diego	Avian Research Associates	2
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY



Chains of diatom Thalassionema are often observed in our phytoplankton samples.

Pseudo-nitzschia exhibits a characteristic overlapping pattern between cells in a chain.



The dinoflagellate Dinophysis tripos is a rare sight in our plankton samples.